REMARKS

Claims 1-20 are pending in the application. Reexamination and reconsideration of claims 1-20, are respectfully requested in view of the following remarks.

Claim Rejections - 35 USC § 112

Claims 1-20 have been rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. Applicant respectfully traverses the rejection in light of the arguments presented below.

Claims 1-4 and 17-20 have been rejected under 35 U.S.C. §112, second paragraph, as being incomplete for omitting essential steps. In particular, the office action states that it is unclear how the method determines if the diffusion coefficient signal corresponds to a characteristic of a known analyte. Claims 5-16 have been rejected under 35 U.S.C. §112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements. In particular, the office action states that it is unclear how the device determines if the diffusion coefficient signal corresponds to a characteristic of a known analyte.

As claimed in independent claims 1, 5, 13, and 17, an analyte output signal that identifies a characteristic of an analyte will be generated "if said diffusion coefficient signal corresponds to a characteristic of a known analyte." Paragraph [0034] of the application discloses a decision means for generating an analyte output signal 124, with FIG. 1 showing an example of such decision means – a pattern recognizer 122. Because the pattern recognizer generates the analyte output signal, the pattern recognizer also determines if the diffusion coefficient signal corresponds to a characteristic of a known analyte, as the correspondence determination is involved in the generation of the analyte output signal.

According to MPEP section 2164.05(a), "the specification need not disclose what is well-known to those skilled in the art and preferably omits that which is well-known to those skilled and already available to the public." Applicants have met the requirements of section 2164.05(a) by describing in paragraph [0034] of the disclosure that the "pattern recognizer 122 may utilize a look-up table, a neural network, or other processing means" (specification pg. 13, lines 6-7), as well as in paragraph [0045] of the disclosure that "fourth instruction means 310 may utilize a look-up table, a neural network, or other processing means" (specification pg. 18, lines 11-13). As substantiated by the attached Declaration of Gabor Schmera under 37 C.F.R. §1.132 (Declaration), it was known in the art at the time of the filing of the instant application how to determine if the diffusion coefficient signal corresponds to a characteristic of a known analyte based upon the disclosure provided in the originally filed application. All of the references cited in the Declaration were available to the public before the filing date of the instant application.

Thus, Applicants respectfully request that the 35 U.S.C. §112 rejection of claims 1-20 be withdrawn.

A supplemental information disclosure statement (IDS) has been submitted with this Response. The IDS cites U.S. Patent No.'s 6,170,318 (Lewis), 6,350,369 (Lewis et al.), and 6,387,329 (Lewis et al.), which were referenced and relied upon in the Declaration to support the position that one with ordinary skill in the art as of the filing date of the instant application would have known how to determine if a diffusion coefficient signal corresponds to a characteristic of a known analyte by use of a pattern recognizer, such as a lookup table or neural network, as disclosed in the instant application. U.S. Pat. No. 6,044,332 (Korsah et al.) and the cited publication were previously submitted in an IDS on October 2, 2003.

CONCLUSION

Based on the above, Applicant submits that claims 1-20 are in condition for allowance and respectfully requests that a Notice of Allowance be issued in this case in due course.

If it is felt for any reason that direct communication with Applicants' attorney would serve to advance prosecution of this application to allowance, the Examiner is invited to contact the undersigned attorney, Ryan J. Friedl, Esq., at the telephone number listed below.

Dated: June 1, 2007

Respectfully Submitted,

Space and Naval Warfare Systems Center

By: ____________
Ryan J. Friedl, Esq.
Registration No. 56,357
Attorney for Applicants

OFFICE OF PATENT COUNSEL, Code 20012
Space and Naval Warfare Systems Center
53510 Silvergate Ave., Room 103
San Diego, CA 92152-5765

Telephone: (619) 553-6364
Facsimile: (619) 553-3821
Email: ryan.friedl@navy.mil

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Kish, Laszlo B.	**Examiner: Sines, Brian J.**
Serial No.: 10/677,684	**Art Unit: 1743**
Filed: 10/2/2003	**Confirmation No.: 8816**
Title: System and Method of Fluctuation Enhanced Gas-Sensing Using SAW	

DECLARATION OF GABOR SCHMERA UNDER 37 C.F.R. §1.132

I, Gabor Schmera, hereby declare:

1. I am a joint inventor for the subject application.

2. I have been asked by Mr. Ryan J. Friedl, the patent attorney representing me before the USPTO with regard to the subject application, to consider whether it would have been well-known by one having ordinary skill in the arts of chemical analysis and chemical sensors, as of October 2, 2003, how to determine if a diffusion coefficient signal corresponds to a characteristic of a known analyte given the disclosure provided in the originally-filed application. This declaration addresses that issue and states my opinion that such determination would have been well-known.

3. My post-secondary school education is as follows:
    a. B.S., Computer Science, 1989, University of Missouri, St. Louis, MO

4. In support of this declaration, I have read the following:
    a. Utility patent application serial number 10/677,684, including the specification, drawings, and claims;
    b. Office action for serial number 10/677,684, mailed March 14, 2007;
    c. Relevant portions of U.S. Pat. No. 6,044,332 (Korsah et al), granted May 28, 2000;
    d. Relevant portions of U.S. Pat. No. 6,170,318 (Lewis), granted January, 9, 2001;

e. Relevant portions of U.S. Pat. No. 6,350,369 (Lewis et al), granted February 26, 2002;

f. Relevant portions of U.S. Pat. No. 6,387,329; (Lewis et al), granted May 14, 2002;

g. Hines, E.L., *Electronic Noses: A Review of Signal Processing Techniques*, IEE, Proc.-Circuits Devices Syst., Vol. 146, No. 6, December 1999.

5. I have been employed at the Space and Naval Warfare Systems Center and its predecessor organizations since 1991, where I am presently a Technical Lead of the Leveraging Available Intelligence Sources to Improve Correlation (LAISIC) project in the Joint and National Systems branch of the Intelligence, Surveillance and Reconnaissance division. My present duties include developing, testing and evaluation signal processing and data mining algorithms that exploit nonlinear and stochastic behavior.

6. I am an expert in Fluctuation Enhanced Sensing, Applied Stochastic Processes, Computer Simulation, Software Engineering, Scientific Computing, and Applied Mathematics, and am qualified to opine as to the level of ordinary skill in the fields of chemical analysis and chemical sensors as of the filing date of the subject application. I am also a named joint inventor of issued patent number 6,020,782 entitled "Noise Assisted Signal Processor with Non-linear Coupled Arrays of Non-linear Coupled Elements," and have two patents pending in related fields. Additionally, I am an author/co-author of 15 published articles in this field (see Appendix A). My articles have been published in journals such as *IEEE Sensors Journal, Sensors and Actuators B, Fluctuation and Noise Letters, Physical Review E, Journal of Statistical Physics Biological Cybernetics, Physical Review A, and Irreversible Processes and Self-Organization.*

7. I have reviewed the relevant portions of U.S. Pat. No. 6,044,332. This patent involves methods and apparatus for surface acoustic wave harmonic analysis of chemicals, biological agents, radiation, and other detectable phenomena (col. 3, lines 58-60). The patent discloses acquiring data sets in a calibration mode using expected interfering gases, and using the resulting data to develop a baseline. Then, when in detection mode, the data sets acquired by the spectral signal processing and control system are compared with the baseline to identify a gas of interest (col. 4, lines 66-67 to col. 5, lines 1-4). Further, this patent discloses that a neural network may be used to develop a harmonic signature from measurements to identify the chemical species and concentration to facilitate automatic processing and recognition (col. 4, lines 60-65; col. 5, lines 29-32). Thus, it was known in the art as of the filing date of the instant application to use a neural network to compare outputs of sensors to stored calibrated data to identify a gas of interest. Therefore, one with ordinary skill in the art would have known how to determine if a diffusion coefficient signal corresponds to a characteristic of a known analyte by use of a pattern recognizer, such as a lookup table or neural network, as disclosed in the instant application.

8. I have reviewed the relevant portions of U.S. Pat. No. 6,170,318. This patent involves methods of use and devices for detecting analyte in fluid (*see* Abstract). The device compares a response from the detector with a stored ideal response to detect the presence of analyte (*see* Abstract). This patent uses iterative profiling of known analytes to identify unknown analytes. A structure-function database correlating analytes and response profiles is generated, against which unknown analytes may then be characterized or identified using response pattern comparison and recognition algorithms (col. 11, lines 54-63). Neural-

network based hardware may be used as part of the comparison algorithm (col. 11, lines 63-67 to col. 12, lines 1-5). Thus, it was known in the art as of the filing date of the instant application to use a neural network for response pattern comparison and recognition to identify unknown analytes. Additionally, it was known in the art as of the filing date of the instant application to store ideal responses of known analytes and store the responses in a database (i.e. lookup table), from which responses of an unknown analyte can be compared to identify the unknown analyte. Therefore, one with ordinary skill in the art would have known how to determine if a diffusion coefficient signal corresponds to a characteristic of a known analyte by use of a pattern recognizer, such as a lookup table or neural network, as disclosed in the instant application..

9. I have reviewed the relevant portions of U.S. Pat. No. 6,350,369. This patent involves chemical sensors for detecting the activity of a molecule or analyte (*see* Abstract). This patent uses iterative profiling of known analytes to identify unknown analytes. A structure-function database correlating analytes and response profiles is generated, against which unknown analytes may then be characterized or identified using response pattern comparison and recognition algorithms (col. 11, lines 21-24). Neural-network based hardware may be used as part of the comparison algorithm (col. 11, lines 25-32). Thus, it was known in the art as of the filing date of the instant application to use a neural network for response pattern comparison and recognition to identify unknown analytes. Additionally, it was known in the art as of the filing date of the instant application to store ideal responses of known analytes and store the responses in a database (i.e. lookup table), from which responses of an unknown analyte can be compared to identify the unknown analyte. Therefore, one with ordinary skill

in the art would have known how to determine if a diffusion coefficient signal corresponds to a characteristic of a known analyte by use of a pattern recognizer, such as a lookup table or neural network, as disclosed in the instant application.

10. I have reviewed the relevant portions of U.S. Pat. No. 6,387,329. This patent discloses a method for determining a physical, chemical, and/or biological characteristic of a molecule (col. 3, lines 7-8). The method uses a sensing device to produce a characteristic experimental pattern generated by a plurality of sensors. The pattern has information on the molecular properties for a molecule or analyte of interest as well as information regarding the analyte's or molecule's diffusion coefficient data. A response pattern is produced for each member of the library. The response patterns may include a change in signal over a period of time. Such change in the pattern is indicative of the diffusion coefficient of a molecule or analyte. These patterns are then stored and associated with the library. The library contains patterns for molecules having a desired or known property or activity (col 3, lines 9-20). Thus, it was known in the art as of the filing date of the instant application to store known response patterns of an analyte in a library (i.c. database, lookup table), then to compare stored response patterns to response patterns of unknown analytes to identify the unknown analytes. Therefore, one with ordinary skill in the art would have known how to determine if a diffusion coefficient signal corresponds to a characteristic of a known analyte by use of a pattern recognizer, such as a lookup table or neural network, as disclosed in the instant application.

11. I have reviewed the journal article entitled *Electronic Noses: A Review of Signal Processing Techniques.* This article provides a review of signal processing techniques use in connection with electronic noses - arrays of electronic chemical sensors capable of recognizing both simple and complex odors (*see* pg. 297, col. 1). A pattern recognition engine is used to correlate known odors with unknown odors (*see* pg. 298, col. 1, section 2). A set of known odors are systematically introduced to the electronic nose, which then classifies them according to known descriptors held in a knowledge base. Then, in a second stage, an unknown odor is tested against the knowledge base the predicted membership class is given. (*see* pg. 298, col. 1, section 2). The signal processing techniques used to help with the odor prediction include: linear calibration methods (section 2.2.1), non-linear calibration methods (section 2.2.3), artificial neural networks (section 2.3.4). Thus, it was known in the art as of the filing date of the instant application to use a signal processing technique, such as employing a neural network, to help classify an unknown odor against a stored knowledge base (i.e. lookup table). Therefore, one with ordinary skill in the art would have known how to determine if a diffusion coefficient signal corresponds to a characteristic of a known analyte by use of a pattern recognizer, such as a lookup table or neural network, as disclosed in the instant application.

12. In view of the cited patents, publication, and my experience in the field, those having ordinary skill in the fields of chemical analysis and chemical sensors as of the filing date of the subject application would have known how to utilize a pattern recognizer, such as a look-up table, or neural network, to determine if a diffusion coefficient signal corresponds to a characteristic of a known analyte.

13. The undersigned declares further that all statements made herein of his own knowledge are true; and that all statements not based on his own knowledge are believed to be true; and further that these statements were made with the knowledge that willful false statements are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

Gabor Schmera 06-01-07

GABOR SCHMERA DATE

APPENDIX A

PATENTS/PUBLICATIONS/PROCEEDINGS OF GABOR SCHMERA

Patents:

T.R. Albert, A.R. Bulsara, G. Schmera, M. Inchiosa "Noise Assisted Signal Processor with Nonlinearly Coupled Arrays of Nonlinear Dynamic Elements", Patent number: 6020782 (2000)

Peer reviewed journal articles:

L.B. Kish, G. Schmera, M.D. King, M. Cheng, R. Young, C.G. Granqvist, "Fluctuation-Enhanced Chemical/Biological Sensing and Prompt Identification of Bacteria", J. of High Speed Electronics and Syst., in press (2007)

L.B. Kish, M. Cheng, J.U. Kim. S. Seo, M.D. King, R. young, A. Der, G. Schmera, "Estimation of Detection Limits of the Phage-Invasion Based Identification of Bacteria", Fluct. Noise Lett., 5 (2005)
L105-L108

L.B. Kish, Y. Li, J.L. Solis, W.H. Marlow, V. Lantto, J.M. Sjulko, G. Schmera "Detecting Harmful Gases Using Fluctuation-Enhanced Sensing", IEEE Sensors Journal 5 (2005) 671-767

G. Schmera, L.B. Kish, "Surface diffusion enhanced chemical sensing by surface acoustic waves", Sensors and Actuators B 93 (2003) 159-163

G. Schmera, L.B. Kish, "Fluctuation Enhanced Chemical Sensing by Surface Acoustic Wave Devices", Fluct. Noise Lett., 2 (2002) L117-L123

L.B. Kish, Z. Gingl, Sz. Marton, J. Kertesz, F. Moss, G. Schmera, A. Bulsara, "1/f noise in systems showing stochastic resonance", J.Stat.Phys. 70 (1993) 451

A.R. Bulsara, G. Schmera: "Stochastic resonance in globally coupled nonlinear oscillators", Phys. Rev. E 47, 3734-3737 (1993)

G. Schmera, A. Bulsara, D. Pierson, F. Moss, E.D. Cera, "Looking at Fokker-Planck dynamics with a noisy instrument", J.Stat.Phys. pp. 1179-1190 (1993)

A.R. Bulsara, A.J. Maren, G. Schmera, "Single effective neuron: dendritic copuling effects and stochastic resonance, Biological Cybernetics, V. 70, pp.145-156 (1993)

G. Schmera, P. Jung, F. Moss, "Diffusion on the chaotic web of a Hamiltonian oscillator with incommensurate forcing", Phys. Rev. A 45, 4562-5468 (1992)

L. Schimansky-Geier, F. Moss, G. Schmera, "Influence of Colored Noise on Hopf-Bifurcating Systems", Teubner Series on Physics, pp. 231-239 (1989)

Conference Proceedings:

L.B. Kish, G. Schmera, M.D. King, M. Cheng, A. Berger, "Fluctuation-Enhanced Chemical/Biological Sensing and Prompt Identification of Bacteria", invited paper, 2006 Symposium of Spectral Sensing Research (ISSSR 2006)

J. Kim, L.B. Kish, G. Schmera, "Identifying different types of stochastic processes with the same spectra", Noise and Information in Nanoelectronics, Sensors, and Standards III, (2005), pp. 200-203

G. Schmera, L.B. Kish, "Combinatorial Molecule Counting by Fluctuation-Enhanced Sensors", SPIE Conference on Smart Electronics, MEMS, BioMems, and Nanotechnology, SPIE Proceedings v5055, (2003), pp. 120-124

G. Schmera, L.B. Kish, J. Smulko, "Fluctuation-enhanced chemical sensing", invited paper, Noise in Electronic Devices and Circuits, SPIE Proceedings, v5115, (2003), p 377-85

J. Smulko, L.B. Kish, G. Schmera, "Application of Nonlinearity Measures to Chemical Sensor Signals", Noise and Information in Nanoelectronics, Sensors and Standards, SPIE Proceedings, v5115 (2003) 92-100

T.R. Albert, A.R. Bulsara, G. Schmera, M. Inchiosa, "An Evaluation of the Stochastic Resonance Phenomenon as a Potential Tool for Signal Processing", Twenty-Seventh Asilomar Conference on Signal Processing, (1993), pp:583-587